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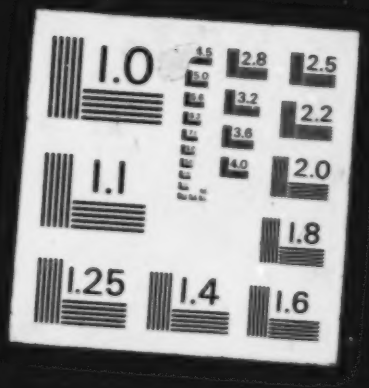

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Feeding by Alaska Whitefish, Coregonus nelsoni, During the Spawning Run

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16. ABSTRACT

Active feeding by a Coregonid species during prespawning run is documented. Alaska Whitefish, Coregonus nelsoni, fed extensively on eggs of least Cisco, Coregonus sardinella, during early October, 1977 in the Chatanika River near Fairbanks, Alaska. Volume of eggs per stomach ranged between 1.5 and 42.4 ml ($\bar{X}$ = 19.96 ml). Numbers of eggs per stomach ranged between 200 and 7,842 ($\bar{X}$ - 3,574). Other isolated food items included aquatic invertebrates and vertebrates, and debris.

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JOURNAL ARTICLE

FEEDING BY ALASKA WHITEFISH, *COREGONUS NELSONI*, DURING THE SPAWNING RUN

It seems to be generally agreed that most coregonids feed but little, if at all, during their prespawning run and only minimally until spawning has taken place (Wagler 1927; Hart 1930, 1931; Birrer and Schweizer 1936; Van Oosten and Deason 1939; Slack et al. 1957; Qadri 1961; A. H. Townsend and Ray Baxter, Alaska Department of Fish and Game, pers. commun.). Coregonids are, however, known to feed, at least to some extent, during the spawning period, but we have not found any published indications of whether such feeding is pre- or post-spawning of the individual fish. Until the individual fish has at least begun to spawn, feeding is at a very low level (Wagler 1927; Hart 1930, 1931; Birrer and Schweizer 1936; Jacobsen 1974). Subsequent to spawning, feeding intensity increases greatly, apparently compensating for the loss of condition due to spawning. Coregonid and other fish eggs are often an important food item at this time (Bajkov 1930; Jacobsen 1974). The few eggs taken by presumed prespawners are probably ingested incidentally to normal respiratory movements rather than by deliberate feeding (Hart 1930).

The purpose of the present paper is to document an instance of active feeding by a coregonid species during the prespawning run.

The least cisco, *Coregonus sardinella*, and Alaska whitefish (*Coregonus nelsoni* = *C. clupeaformis* complex of McPhail and Lindsey 1970) of the rivers of interior Alaska exhibit highly concentrated spawning runs. In the Chatanika River, near Fairbanks, these fishes begin their upstream movement in late June and early July. The larger fish begin their migration first, moving upstream in a seemingly rather indefinite fashion across the Minto Flats. As the summer progresses, the fish congregate in the lower reaches of the river east of the Minto Flats. In the middle to latter part of September, there is a concentrated upstream movement of virtually the entire adult population. This is a journey of approximately 150 km to the spawning areas and is accomplished in a period of 2 to 4 wk (Kepler[1]; Townsend and Kepler[2]).

On 2 October 1975, we collected 25 (10 males, 15 females) Alaska whitefish and 23 least cisco in the Chatanika River near Fairbanks, Alaska. The fish were seined at two locations, one approximately 6.6 river km below the Elliott Highway bridge (lat. 65°4.5′N, long. 147°45.6′W), the other 3.1 km farther downstream (lat. 65°3.7′N, long. 147°47.3′W) between 1000 and 1200 h. Water depths were 0-2.5 m; water temperature was 1.5°C. These locations are within the major spawning area of the least cisco in the Chatanika River. A few Alaska whitefish also spawn in this part of the river, but their major breeding grounds lie some 15-25 km farther upstream. All the least cisco were fully ripe and running eggs or milt. The Alaska whitefish were all mature but not quite fully ripe. Most of the eggs of the females were still in fairly firm skeins. We estimated that these fish would not have spawned for another 2 wk.

The stomachs of all the fish were removed after return to the laboratory in the evening and stored in 10% Formalin[3] and the contents analyzed during the following 2 wk. Egg counts of each stomach were made by counting the eggs in each of two 1-ml samples, then estimating the total by comparison with the total volume of eggs in the stomach.

The stomachs of all least cisco were much reduced in size. Except for one containing six fish eggs and another with five unidentified seeds, all were empty. By contrast, the stomachs of all the

[1]Kepler, P. P. 1973. Population studies of northern pike and whitefish in the Minto Flats complex with emphasis on the Chatanika River. Alaska Dep. Fish Game, Fed. Aid Fish Restoration, Annu. Prog. Rep. Proj. F-9-5, Job G-II-J. 14, 23 p.

[2]Townsend, A. H., and P. P. Kepler. 1974. Population studies of northern pike and whitefish in the Minto Flats complex with emphasis on the Chatanika River. Alaska Dep. Fish Game, Fed. Aid Fish Restoration, Annu. Prog. Rep. Proj. F-9-6, Job G-II-J. 15, 21 p.

[3]Reference to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

Alaska whitefish were more or less distended and crammed with eggs, almost all of them least cisco eggs. A few larger eggs in the stomachs were probably those of the Alaska whitefish.

Volume of eggs per stomach ranged between 1.5 and 42.4 ml ($\bar{x}$ = 19.96 ml). Numbers of eggs per stomach ranged between 200 and 7,842 ($\bar{x}$ = 3,574). Other items, present only in insignificant amounts, included Diptera, Tendepedidae, Trichoptera, Hydracarina, unidentified insect parts, a tree bud, and a small slimy sculpin, *Cottus cognatus*.

As indicated previously, extensive life history studies of this species conducted by the Alaska Department of Fish and Game have shown that prespawners do not feed. Presumably, then, the phenomenon reported here is of rare occurrence. However, if the entire Alaska whitefish population of the Chatanika River, estimated at 7,000 to 8,000 fish (see footnotes 1, 2) should engage in this activity, then it might constitute a major source of egg mortality for the least cisco population. Since both species are important components of the sport fishery resources of the Chatanika River, the matter is worth further investigation.

The samples reported upon here were collected as part of a study of the environmental effects of the Trans-Alaska Pipeline crossing of the Chatanika River. This study is conducted jointly by the Division of Life Sciences, University of Alaska, Fairbanks, Alaska, and the Arctic Environmental Research Laboratory, Environmental Protection Agency, Fairbanks, and is supported by the Environmental Protection Agency.

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